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going very close, nor flying directly at the lights as most of the Warblers did. I could not identify the species, but think most of them were *pallasi*. I saw one young Robin, but he soon bent his course downwards to some shade tree where I have no doubt he found a roosting place.

Carolina (?) Rails were frequently heard, especially on the 21st, 22d, and 23d; they seemed to be flying on a lower level than the dome, barely above the housetops. None were seen around the tower. The same remarks apply to the Florida Gallinule. Night Herons (*N. nycticorax nævius*) and some other Herons that I think were *Botaurus lentiginosus* passed frequently from the 22d to the 26th. They did not seem to be attracted by the lights and appeared to be flying considerably higher than the dome, I should think at least 100 feet or more. English Snipe were noticed a few times, but only flew rapidly by. This was one of the few species I observed that were flying in the normal manner.

Small Sparrows that looked like *Melospiza georgiana* were frequently noticed, but the species could not be determined with certainty. They arrived singly, and came from a lower level than the lights on the tower, and in passing by always directed their course downwards, as far as I was able to see them in the darkness.

One feature that especially interested me was that nearly all the birds I observed had a peculiar dragging flight like a bird wounded through the intestines; it reminded me forcibly of the peculiar flight of the male *Icteria virens* during nesting time. Any ornithologist who has observed this will recall the unnatural flight, the wings are raised high, tail dropped low and head raised, so that the body instead of being carried nearly horizontally is at a considerable slope. The first impression suggested was of extreme fatigue, but it is probable the birds are better able to sustain continued flight by flying in this manner with the wind.

Another interesting fact is that among the forty odd species and many times that number of specimens I only detected four adult birds.

Apparently most of the birds were killed by coming into contact with the electric wires, as there was not a bruise nor hardly a ruffled feather on them. Some had flown against the lights and broken or bruised their bills, others had torn the skin or feathers from the side of the head or throat, and in two instances the wings were gone. Two or three had their necks broken.

I estimate the number procured at about fifty per cent of those killed. A large number fell on inaccessible roofs, or were blown into the eave troughs during the high winds and lost.—**LUDWIG KUMLIEN, Milwaukee, Wisconsin.**

Osteological Notes upon Puffins and Ravens.—In examining some skeletons of adult specimens of *Lunda cirrhata*, kindly loaned me by the Smithsonian Institution, I find, occupying the usual site of the bone, but completely enveloped by the tarsal theca, a rudimentary accessory metatarsal, or the hallux metatarsal, which is freely articulated, but all evidence of a basal phalanx of the toe is absent. Such a rudimentary element in

the skeleton of a bird is an interesting fact, and it sees its counterpart in the rudimentary limbs in such a lizard as *Ophisaurus ventralis*.

While engaged upon dissecting the eyes of adult Ravens (*Corvus corax sinuatus*), I have always found a firm osseous plate, of an elliptical outline, with a major axis of some 5 or 6 millimetres surrounding the entrance of the optic nerve, on the outer coat of the eye. In a 'Bulletin' which I have in the hands of the Smithsonian Institution for publication, I figure this structure, as well as the rudimentary metatarsal bone, to which I have alluded above. — R. W. SHUFELDT, *Fort Wingate, New Mexico*.

Abnormalities in the Ribs of Birds.—Those who have examined many series of skeletons are well aware that the number of ribs in any given species is liable to vary, and that an animal may possess a pair more than the normal number for the species, or that in exceptional cases a pair may be wanting.

The additional pair of ribs usually appears on the first lumbar vertebra, or what would normally be the first, although now and then a short, styliform pair of pleurapophyses may be present on the seventh vertebra of mammals, or in fishes on the ex-occipitals.

The greater number of segments in the vertebral column, and the more generalized the animal, the greater seems the tendency to variation, and in the Urodele Batrachia even the number of dorsal vertebræ is extremely inconstant.

The following list of costal abnormalities, noted in a comparatively small number of skeletons, would seem to show that in birds the rib element is subject to frequent variations.

Galeoscoptes carolinensis with but five pairs of complete ribs, instead of the normal passerine number of six, the abnormality being caused by the lack of a hæmapophysis on the rib attached to the fifteenth vertebra. The styliform rib on the fourteenth vertebra was also reduced in size.

Galeoscoptes carolinensis with seven pairs of ribs, a hæmapophysis connecting the ordinarily free rib of the fourteenth vertebra with the sternum.

Melanoptila glabrirostris and *Clivicola riparia*, each with a seventh pair of ribs with attached hæmapophyses on the second vertebra of the 'sacrum.'

Quiscalus purpureus and *Sturnella magna neglecta*, each with an additional pair of short slender ribs, devoid of hæmapophyses, on the second vertebra of the 'sacrum.' This is a rather curious coincidence, as the two birds are presumably nearly related. It is the more interesting from the fact that among birds the dorsal portion of the rib is the first to be suppressed, and instances are numerous—as among Raptore—where a pair of hæmapophyses is normally present without the slightest trace of corresponding pleurapophyses. An intermediate condition is found in some birds, e. g., *Trochilus colubris* and *Cypselus apus*—a complete hæmapophysis supporting a pleurapophysis whose upper moiety is lacking.

Examination of the large series of sacra of *Alca impennis* in the collection of the U. S. National Museum shows that in this bird an extra (ninth)